

Claim 12 was objected to because it does not exist. Claims 13-18 have been renumbered as Claims 12-17. Accordingly, withdrawal of the Examiner's objection is respectfully requested.

Claim 14 (now Claim 13) was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. There was insufficient antecedent basis for the limitation "the number of forward error correction bits" in the claim. Claim 14 has been amended to remedy this antecedent basis issue, and is now considered to be clear and definite. Accordingly, withdrawal of the Examiner's rejection is respectfully requested.

Claims 1-6, 8-10, 12, 14, and 16 (as amended) were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,822,310 issued to Chermakeshu et al.

The present invention provides for a rain fade mitigation method and data distribution system employing the method which is preferably used in RF or satellite-based data distribution system. The present invention provides improved performance when the system operates in a rain fade environment.

One embodiment includes a transmitting processor that processes data packets comprising data to be transmitted. The data distribution system is used to transmit the data packets to one or more receivers located at remote locations. The data distribution system is used to transmit the data a first time. The data is then transmitted a second time after a time delay that is nominally equal to the duration of an average rain event. This time is on the order of 20-30 minutes. The receivers receive the data packets and recover the originally transmitted data.

In another embodiment, the transmitting processor also comprises forward error correction processing software that adds forward error correction bits to data packets containing the data to be transmitted. The data distribution system is used to transmit the data packets to one or more receivers located at remote locations. The packets are transmitted two or more times with a time delay between transmissions that is nominally equal to the duration of an average rain event. The receivers receive the transmitted packets, and also comprise forward error correction software that processes the received data packets to reconstruct the original data. The number of forward error correction bits added to each packet is configurable, and is typically up to about fifty percent of the number of bits in the data packet.

In yet another embodiment, the data packets include forward error correction bits and are transmitted one time at a relatively slow transmission rate. The data transmission rate is chosen so that the time required to transmit the data to the receiver is greater than or equal to the time necessary to transmit the data plus the amount of time equal to an average rain fade event (20-30 minutes).

In contrast, the Chermakeshu et al. patent discloses a method for transmitting short alphanumeric messages in which signal margin is increased by a combination of bit or message repetition and a relatively small increase in power. This avoids unacceptable delays characteristic of systems which rely solely on repetition to increase the signal margin. To

ensure reliable transmission over channels having severe attenuation, the short message is encoded with error detection coding to form one or more data codewords. Each codeword is transmitted multiple times over a message channel having message frames. Each message frame is made up of time slots from each TDMA frame or each set of TDMA frames. The message channel is transmitted at a power level greater than the power level for voice transmission and greater than the power level for control information transmission. The message channel may be formed by slots taken from the broadcast control channel or other suitable channel.

The Chermakeshu et al. patent does not disclose or suggest anything regarding rain mitigation or use of the system in a rain fade environment. In fact, "rain" and "rain fade environment" are not used in the Chermakeshu et al. patent.

The Chermakeshu et al. patent discusses Ricean fading, which occurs from a combination of a strong line-of-sight path and a ground-reflected wave, along with weak building-reflected waves. The Chermakeshu et al. patent also discusses Rayleigh fading which occurs when a mobile unit antenna is not deployed or the mobile unit is in an obstructed location (e.g., inside a building), and reflected waves, including ground-reflected and building-reflected waves, become dominant.

Furthermore, the Chermakeshu et al. patent does not disclose or suggest anything regarding transmitting data packets at least two times to one or more remote receivers at times are separated by a time delay having a duration that is related to a rain fade event. The Chermakeshu et al. patent also does not disclose or suggest anything regarding transmitting data packets at a relatively slow transmission rate such that the time required to transmit the data to the one or more receivers is greater than or equal to the time necessary to transmit the data plus an amount of time sufficient to allow data reconstruction in the presence of a rain fade event.

The Chermakeshu et al. patent also does not disclose or suggest anything regarding transmitting data packets at least two times to one or more remote locations, which times are separated by a time delay having a duration that is related to a rain fade event, which time delay is sufficient to allow data reconstruction in the presence of the rain fade event. In addition, the Chermakeshu et al. patent also does not disclose or suggest anything regarding transmitting data packets at a relatively slow transmission rate such that the time required to transmit the data to the one or more receivers is greater than or equal to the time necessary to transmit the data plus an amount of time sufficient to allow data reconstruction in the presence of a rain fade event.

It is respectfully submitted that the fact that the Chermakeshu et al. patent discloses a system and method for reliably transmitting messages via radio communication signals under non-ideal conditions is not a disclosure or suggestion of the specifically recited aspects contained in the pending Claims. In particular, the Chermakeshu et al. patent does not address rain fade mitigation or transmitting data with a time delay therebetween, transmitting data at a

relatively slow transmission rate, transmitting data at times are separated by a time delay having a duration that is related to a rain fade event, or transmitting data at a relatively slow transmission rate such that the time required to transmit the data to the one or more receivers is greater than or equal to the time necessary to transmit the data plus an amount of time sufficient to allow data reconstruction in the presence of a rain fade event, as is provided for in the present invention.

Therefore, and with specific regard to the invention recited in Claim 1, it is respectfully submitted that the Chermakeshu et al. patent does not disclose or suggest "a data distribution system for transmitting the data packets at least two times to one or more receivers located at remote locations, which times are separated by a time delay having a duration that is related to a rain fade event, which time delay is sufficient to allow data reconstruction in the presence of the rain fade event". It is respectfully submitted that the Chermakeshu et al. patent does not disclose or suggest that "the one or more receivers receiving the data packets and processing the data packets transmitted the at least two times to reconstruct the originally transmitted data" as is recited in Claim 1.

With regard to the invention recited in Claim 8, it is respectfully submitted that the Chermakeshu et al. patent does not disclose or suggest "a data distribution system for transmitting the data packets to one or more receivers located at remote locations, which data packets are transmitted at a relatively slow transmission rate such that the time required to transmit the data to the one or more receivers is greater than or equal to the time necessary to transmit the data plus an amount of time sufficient to allow data reconstruction in the presence of a rain fade event" or that "the receivers receiving the data packets and processing the received data packets using forward error correction processing to reconstruct the original data."

With regard to the invention recited in Claim 12 (as amended), it is respectfully submitted that the Chermakeshu et al. patent does not disclose or suggest "transmitting the data packets at least two times to one or more remote locations, which times are separated by a time delay having a duration that is related to a rain fade event, which time delay is sufficient to allow data reconstruction in the presence of the rain fade event".

With regard to the invention recited in Claim 16 (as amended), it is respectfully submitted that the Chermakeshu et al. patent does not disclose or suggest "transmitting the data packets and forward error correction bits to one or more remote locations, which data packets are transmitted at a relatively slow transmission rate such that the time required to transmit the data to the one or more receivers is greater than or equal to the time necessary to transmit the data plus an amount of time sufficient to allow data reconstruction in the presence of a rain fade event".

In view of the above, it is respectfully submitted that the inventions recited in independent Claims 1, 8, 12 and 16 are not disclosed or suggested by the Chermakeshu et al.

patent. Accordingly, withdrawal of the Examiner's rejection and allowance of Claims 1, 8, 12 and 16 is respectfully requested.

Dependent Claims 2-6, 9 and 10 are considered patentable based upon their dependence from allowable Claims 1 and 8. Accordingly, withdrawal of the Examiner's rejection and allowance of Claims 2-6, 9 and 10 is respectfully requested.

Dependent Claims 7, 11, 13, 15 and 17 (as amended) were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,822,310 issued to Chermakeshu et al. Dependent Claims 7, 11, 13, 15 and 17 are considered patentable based upon their dependence from allowable Claims 1, 8, 12 and 16. Accordingly, withdrawal of the Examiner's rejection and allowance of Claims 7, 11, 13, 15 and 17 is respectfully requested.

In view of the above, it is respectfully submitted that all pending claims are not anticipated by, nor are they obvious in view of the Chermakeshu et al. patent, and are therefore patentable. Accordingly, it is respectfully submitted that the present application is in condition for allowance. Reconsideration of this application and allowance thereof are earnestly solicited.

Respectfully Submitted,



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